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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/785,616

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Gerd O. Mueller

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10/12/2006

PATENT LAW GROUP LLP
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EXAMINER

KIKNADZE, IRAKLI

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 10/12/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/785,616	Applicant(s) MUELLER ET AL.	
	Examiner Irakli Kiknadze	Art Unit 2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 28-30 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 18-27 is/are allowed.
- 6) ☒ Claim(s) 1,2,6-13 and 17 is/are rejected.
- 7) ☒ Claim(s) 3-5 and 14-16 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 February 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/12/04; 04/14/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. In response to the Office action dated March 14, 2006 the Amendment has been received on July 13, 2006.

Claim 1 has been amended.

Claims 1-30 are currently pending from this application. Claims 28-30 are withdrawn from consideration as being drawn to a nonelected invention.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 6, 7, 11-13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bawendi et al. (US Patent 6,501,091) in view of Camras et al. (US Patent Application Publication 2002/0030194 A1).

With respect to claims 1 and 17, Bawendi teaches a system comprising (see Fig. 1):

a semiconductor light emitting device (10) capable of emitting first light having a first peak wavelength (column 4, lines 58-63);

a first fluorescent material layer (20) comprising a first wavelength converting material (22) capable of absorbing the first light and emitting second light having a second peak wavelength longer than the first peak wavelength (column 5, lines 66 and 67); and

a second fluorescent material layer (16) comprising a second wavelength converting material (18) capable of emitting third light having a third peak wavelength longer than the second peak wavelength (column 5, lines 63 and 64), wherein the second fluorescent material layer is disposed adjacent to the semiconductor light emitting device (Fig.1);

wherein at least one of the first fluorescent material layer and the second fluorescent material layer comprise a second material (12) that is not a wavelength converting material (column 4, lines 64-65).

Bawendi teaches that the first and second wavelength converting materials comprises the quantum dots but fails to teach that the first and second wavelength converting materials comprises phosphor. Camras teaches an equivalent structure known in the art, comprising the quantum dots or conventional phosphor particles (see paragraph 0042). Therefore, because these two wavelength converting materials made from the quantum dots and conventional phosphor particles were art-recognized equivalents at the time the invention was made would have found it obvious to substitute a phosphor particles as suggested by Camras for the quantum dots in the apparatus Bawendi.

With respect to claim 2, Bawendi teaches that the second fluorescent material layer (16) overlies the semiconductor light emitting device (10) and the first fluorescent material layer (20) overlies the second fluorescent material layer (16) (see Fig 1).

With respect to claim 6, Bawendi teaches that the quantum dots being suspended within a host matrix, rather than deposited in a solid layer (column 5, lines 1-4). Therefore, the second fluorescent material layer is disposed on a plurality of discrete regions on the semiconductor light emitting device, and the first fluorescent material layer overlies the second fluorescent material layer.

With respect to claim 7, Bawendi teaches that the first peak wavelength is blue; the second peak wavelength is green and the third peak wavelength is red (column 5, lines 56-67).

With respect to claim 8, Bawendi teaches claimed invention, including quantum dots having various emission peaks, specifically 594nm which is within the yellow emission range (column 5, lines 40-42). Bawendi further teaches mixing the quantum dots to produce the desired emission spectrum (column 6, lines 23-34). Bawendi fails to explicitly teach the system include a second peak wavelength of yellow. One of ordinary skill in the art would recognize the use of a yellow photo luminescent quantum dot to produce a desired light emission. It would have been obvious to one of ordinary skill in the art at the time the invention was made to substitute a quantum dot that emits yellow for the quantum dot of Bawendi that emits green because it would produce the desired color emission.

With respect to claims 9 and 10, Bawendi as modified Camras teaches claimed invention except specifying composition of a phosphor used as the first and second wavelength converting material. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the phosphor for the first and second wavelength converting material selected from the group disclosed in claims 9 and 10, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use.

With respect to claim 11, Bawendi teaches that the second material being selected from the group of resin, silicone, and silica (column 6, lines 64-67).

With respect to claim 12, Bawendi teaches the first fluorescent material layer and second fluorescent material layer are arranged to maximize a luminous equivalent of a combination of the first, second and third light (column 6, lines 4-7).

With respect to claim 13, Bawendi teaches the first fluorescent material layer and second fluorescent material layer are arranged to maximize color rendering index of a combination of the first, second and third light (column 6, lines 4-7).

Allowable Subject Matter

4. Claims 3, 4, 5 and 14-16 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. Claims 18-27 are allowed.

6. The following is a statement of reasons for the indication of allowable subject matter:

With respect to claim 3, the prior art fails to teach or make obvious a system wherein the first fluorescent material layer is disposed on a first portion of the semiconductor light emitting device, the second fluorescent material layer is disposed on a second portion of the semiconductor light emitting device and the first portion being adjacent to the second portion, as claimed including all of the limitations of the base claim and any intervening claims.

With respect to claims 4 and 5, the prior art fails to teach or make obvious a system wherein a first fluorescent material layer being disposed on a first plurality of discrete regions on a semiconductor light emitting device, and a second fluorescent layer is disposed on a second plurality of discrete regions on the semiconductor device, as claimed including all of the limitations of the base claim and any intervening claims.

With respect to claims 14-16, the prior art fails to teach or make obvious a system wherein a third fluorescent material layer comprising a third wavelength converting material emitting a fourth peak wavelength as claimed including all of the limitations of the base claim and any intervening claims.

With respect to claims 18-27, the prior art fails to teach or make obvious a device comprising: a cover plate spaced apart from at least one semiconductor light emitting device; a first fluorescent material layer comprising a first wavelength converting material, the first wavelength converting material capable of absorbing the first light and emitting second light having a second peak wavelength, and a second

fluorescent material layer comprising a second wavelength converting material, the second wavelength converting material capable of emitting third light having a third peak wavelength; wherein the first fluorescent material layer and the second fluorescent material layer are disposed on the cover plate as claimed including all of the limitations of the base claim and any intervening claims.

Response to Arguments

7. Applicant's arguments with respect to claims 1, 2, 6-17 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

Art Unit: 2882

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.


9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irakli Kiknadze whose telephone number is 571-272-2493. The examiner can normally be reached on 9:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on 571-272-2490. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Irakli Kiknadze
October 2, 2006

IK



EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER